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Optimizing Paving Concrete Mixtures
and Accelerated Concrete Pavement
Construction and Rehabilitation

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Federal Highway Administration
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# Table of Contents

Foreword ...................................................................................................................................... v  
Acknowledgments....................................................................................................................... vi  

## PART 1. Optimizing Paving Concrete Mixtures

Concrete Mixture Issues for USAF Airfield Pavements  
*Raymond Rollings, James Greene, and Ronald Hutchinson* ..................................................... 3  

Iowa’s Experience Utilizing Optimized Concrete Paving Mixtures  
*Todd Hanson* ........................................................................................................................... 17  

Design and Proportioning of Concrete Paving Mixtures: Industry Considerations  
*Leif Wathne* .............................................................................................................................. 31  

Optimized Concrete Paving Mixtures: Their Origin and Evolution  
*James M. Shilstone, Sr., and James M. Shilstone, Jr.* ............................................................... 45  

Designing Concrete Mixtures for High-Performance Pavements: Maximizing Performance and Minimizing Risk  
*J. Mauricio Ruiz and Ted R. Ferragut* ....................................................................................... 61  

Evaluation of Ternary Concrete Mixtures With GGBFS and Fly Ash for Concrete Pavements  
*Adam Rudy, Jan Olek, Tommy Nantung, and Richard M. Newell* ........................................... 73  

Lab of the Future—Mixture Design and Analysis for Optimized Concrete Paving Performance  
*Richard Meininger and Jussara Tanesi* ...................................................................................... 93  

Material and Construction Optimization for Prevention of Premature Pavement Distress in PCC Pavements  
*Jim Grove* .................................................................................................................................. 111  

Strength and Deicer Scaling Resistance of Grade 100 and Grade 120 Slag Cement Concrete  
*Irene K. Battaglia, Ryan D. Foley, and Steven M. Cramer* ......................................................... 139  

From Concrete Mixture Design to Mixture Proportioning and Analysis With the FHWA COMPASS Software  
*J. Mauricio Ruiz and Sabrina Garber* ........................................................................................ 155  

Effects of Different Air-Entraining Agents, Supplementary Cementitious Materials, and Water-Reducing Agents on the Air Void Structure of Fresh Mortar  
*T. D. Rupnow, V. R. Schaefer, K. Wang, and P. J. Tikalsky* ..................................................... 167  

Using Internal Curing in Concrete Pavements  
*Norbert Delatte and John Cleary* ............................................................................................ 183
Concrete Mixture Properties to Optimize Concrete Pavement Design and Performance Using the MEPDG  
Chetana Rao, Jagannath Mallela, Michael I. Darter, and Leslie Titus-Glover .......... 199

Petrographic Analysis of Concrete Pavements for Assessing Material Properties Related to Early-Age Shrinkage and Other Distresses  
Tom S. Patty and Kevin D. Copeland................................................................. 215

PART 2. Accelerated Concrete Pavement Construction and Rehabilitation

Nondestructive Testing Techniques for Acceptance of Concrete During Accelerated Construction  
Soheil Nazarian, Deren Yuan, Farhad Ansari, Adam Tennant, and Don Alexander ..... 227

Rapid Concrete Panel Replacement in Washington State: Lessons Learned  
Stephen T. Muench, Brett Ozolin, Jeff Uhlmeyer, Linda M. Pierce, and Keith W. Anderson ................................................................. 245

Precast Concrete Pavements and Results of Accelerated Traffic Load Test  
Erwin Kohler, Louw du Plessis, Peter J. Smith, John Harvey, and Tom Pyle .......... 263

New Technique for the Rapid Construction and Rehabilitation of Concrete Pavements  
N. X. C. Bax, A. W. F. M. van Deurzen, and A. A. A. Molenaar .......................... 283

Use of Heavy-Vehicle Simulator to Evaluate Technologies for Rapid Concrete Pavement Rehabilitation  
Erwin Kohler, Louw du Plessis, and John Harvey ............................................. 295

Study on Factors Influencing Characteristics of High-Strength Concrete for Airport Pavements  
Yoshitaka Hachiya, Junichi Noda, Shoichi Kameta, Takashi Tochigi, Yukitomo Tsubokawa, Ryota Maekawa, and Yasushi Takieuchi .............................................. 311

CA4PRS Use in Washington State  
Brett Ozolin, Stephen T. Muench, Jeff Uhlmeyer, and Linda Pierce .................... 329

Precast Prestressed Concrete Pavement for Rapid Bridge Approach Slab Reconstruction  
Mark J. Dunn, Michael D. LaViolette, David K. Merritt, and Samuel S. Tyson ....... 347

Dowel Retrofitting With Rapid-Hardening Repair Materials: Lessons Learned  
Robert J. Gulyas and Sandra Sprouts ............................................................. 361

Economical Rehabilitation of Concrete Pavements Using Very Early Strength Concrete  
Chris Ramseyer and Brent Chancellor ............................................................ 377
Foreword

It is becoming an established practice in the United States to require that concrete pavements provide low-maintenance service lives of 40 or more years. Damage to concrete pavements over the service life is expected to be due to traffic and environmental loadings and not due to concrete materials failure. Therefore, concrete durability is an important attribute of paving concrete. For long-life concrete pavements, the engineering criteria for concrete that are most important are *workability* (matching the concrete to the paving and finishing operations), *durability*, and *strength*. Most production concrete paving on the primary roadway network is carried out using slipform pavers that necessitate the use of concrete that is workable, can be easily consolidated, will not segregate, and can be finished to achieve the desired geometric shape. The finished end product needs to be durable—no early-age distress or materials-related distress. Concrete mixture optimization involves the adaptation of available concrete-making resources to meet varying engineering criteria, construction operations requirements, and economic needs.

Another requirement that is defining how concrete pavements are constructed relates to the need to maintain an accelerated construction schedule for concrete pavement construction and rehabilitation. Construction traffic congestion and construction zone safety are key concerns of motorists and State highway agencies. A goal of all highway agencies is to “Get in, get out, and stay out” when dealing with major highway pavement construction and rehabilitation. However, many State highway agencies are finding that considerable resources are needed to lessen the negative effects resulting from construction within urban, high-volume traffic areas. To minimize the need for frequent pavement construction and rehabilitation activities, highway agencies consider the use of concrete pavement a cost-effective, long-term solution for these high-impact corridors. The use of concrete pavement under these conditions poses many challenges. These challenges can be addressed successfully through careful planning, using the right construction processes, optimizing construction zone traffic management, and implementing public awareness programs.

This 2 1/2-day International Conference on Optimizing Paving Concrete Mixtures and Accelerated Concrete Pavement Construction and Rehabilitation was organized as a part of technology transfer activities for the Concrete Pavement Technology Program that operates within the U.S. Federal Highway Administration. The conference objective was to provide an international forum to address various aspects of concrete mixture optimization and accelerated concrete pavement construction and rehabilitation that result in *long-life concrete pavements*.

The editor thanks the authors for supporting the objective of this conference by developing comprehensive papers related to the two conference themes. The papers included in the proceedings were peer-reviewed for technical content, and the editor also thanks the Conference Steering Committee members and the many reviewers who participated in the review process.

*Editor:*

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